



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,096	05/31/2006	Yuji Yamada	290541US8PCT	5377

22850 7590 08/16/2011
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

MONIKANG, GEORGE C

ART UNIT	PAPER NUMBER
----------	--------------

2614

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

08/16/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/581,096	Applicant(s) YAMADA ET AL.
	Examiner GEORGE MONIKANG	Art Unit 2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5 and 7-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-5, 7-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/581,096.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
|---|---|

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 5/23/2011 have been fully considered but they are not persuasive.

Regarding applicant's argument on page 8 of the arguments filed 5/23/11, that the Fujita et al system only corrects for the distortion caused by each individual speaker, NOT the distortion caused by relative differences in positioning of the speakers, the applicant maintains his stand. The Fujita et al system discloses that an inverse signal from a FIR filter and ultimately the digital signal processor (DSP) is used to compensate for the phase distortion in the speaker system due to differences from the center of the sphere to the speaker units (positioning of the speakers) (*Fujita et al, fig. 4: 6; col. 6, lines 26-37: FIR filter generates inverse impulse responses that compensate for phase distortions; col. 9, lines 14-19: illustrates that the speaker positions caused by phase distortions are compensated for by the digital signal processing (DSP) which includes the FIR filter*).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2614

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2, 4-5, 7-9 & 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4885782, in view of Fujita et al US Patent 5812685, and further in view of Willems, US Patent Pub. 20020025047 A1.

Re Claim 1, Ebarbach discloses an audio signal processing apparatus adapted for delivering an audio signal to a speaker system, comprising: a frequency dividing filter configured to output portions of a preprocessed audio signal input thereto as separate frequency components (Eberbach, fig. 2; col. 3, lines 34-49); at least two drive units which are divided or separated by frequency band, configured to receive the separate frequency components output from the frequency dividing filter (Eberbach, fig. 2; col. 3, lines 34-49); but fails to disclose a FIR filter configured to generate the preprocessed audio signal from a filtered signal by correcting a phase shift between sound waves radiated from drive surfaces of each of the at least two drive untis of the speaker system, the phase shift caused by relative physical locations of the drive surfaces of each of the at least two drive units, the FIR filter generating the preprocessed audio signal using coefficients corresponding to an overall inverse impulse response of the entire speaker system. However, Fujita discloses a speaker system with a FIR filter that

Art Unit: 2614

preprocesses the input audio signals by utilizing a coefficient of inverse correction of speaker responses within a speaker array that to compensate for the phase distortion in the speaker system due to differences from the center of the sphere to the speaker units (positioning of the speakers) (Fujita et al, fig. 4: 6; col. 6, lines 26-37: FIR filter generates inverse impulse responses that compensate for phase distortions; col. 9, lines 14-19: illustrates that the speaker positions caused by phase distortions are compensated for by the digital signal processing (DSP) which includes the FIR filter).

Therefore, it would have been obvious to preprocess the input signals of Eberbach with a FIR filter as taught in Fujita et al (Fujita et al, fig. 4: 6; col. 6, lines 26-37: FIR filter generates inverse impulse responses that compensate for phase distortions; col. 9, lines 14-19: illustrates that the speaker positions caused by phase distortions are compensated for by the digital signal processing (DSP) which includes the FIR filter), for the purpose of creating a more efficient phase compensation between the speakers in the housing. However, the combined teachings of Eberbach and Fujita et al fail to disclose a first filter configured to filter at least one input signal to generate the filtered signal, the first filter supplying the filtered signal to the FIR filter, the first filter having transmission characteristics to localize a sound image origin at arbitrary positions. The Willems reference discloses a system where the input signal is first sent to virtual filters to create virtual speakers sound sources (Willems, fig. 3: 50-53; para 0017: any one of filters 50-53 are virtual filters used to generate virtual speaker sound sources). Hence, it would have been obvious for Eberbach to incorporate the virtual filters of Willems at its

Art Unit: 2614

input end before any other processing for the purpose of generating a virtual speaker sound source.

Re Claim 2, the combined teachings of Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 1, wherein the at least two drive units include a drive unit for reproducing a signal at a high frequency band and a drive unit for reproducing a signal at a low frequency band (Eberbach, fig. 2; col. 3, lines 34-49) and are coaxially disposed with respect to acoustic center (Eberbach, fig. 1; col. 3, lines 22-33).

Claim 4 has been analyzed and rejected according to claim 1.

Re Claim 5, the combined teachings of Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 4, wherein transmission characteristic of the first filter is a frequency characteristic in which group delay characteristic is constant (Fujita et al, fig. 4: 6; col. 6, lines 26-37: FIR filter comprises group delays that can be made constant).

Claims 7 & 8 have been analyzed and rejected according to claim 1.

Re Claim 9, the combined teachings of Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 8, wherein the electro-acoustic transducer is a speaker system (Fujita et al, fig. 4: 6; col. 6, lines 26-37).

Re Claim 12, Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 8, where the FIR filter is an adding unit (Fujita et al, fig. 4: 6).

Art Unit: 2614

Claim 13, the combined teachings of Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 8, wherein the electro-acoustic transducer is an audio amplifier (*Fujita et al, fig. 4: 6, 11; col. 6, lines 26-37*).

1. Claim 14, Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 4, with wherein the first filter means adds, to the input audio signal, an impulse response characteristic which has been selectively switched among impulse response characteristics of plural kinds of electro-acoustic transducers I (*Fujita et al, fig. 4: 6, 11; col. 6, lines 26-37: coefficients associated with the FIR filter are stored in memory were they are selectively utilized for phase compensations*).

Claims 15-17 have been analyzed and rejected according to claim 1.

2. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4885782, Fujita et al, US Patent 5812685 and Willems, US Patent Pub. 20020025047 A1 as applied to claim 8 above, in view of Packard, US Patent 7035417 B1.

Re Claim 10, Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 8, but fail to disclose where an electro-acoustic transducer is a record needle as taught in Packard (*Packard, col. 10, lines 1-17*). It would have been obvious to modify the audio signal processing apparatus with a record needle as taught in Packard (*Packard, col. 10, lines 1-17*) for the purpose of implementing the system with record players.

Art Unit: 2614

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4885782, Fujita et al, US Patent 5812685 and Willems, US Patent Pub. 20020025047 A1 as applied to claim 8 above, in view of Hirade et al, US Patent 7119267 B2.

Re Claim 11, Eberbach, Fujita et al and Willems disclose the audio signal processing apparatus as set forth in claim 8, but fail to disclose where an electro-acoustic transducer is a record recording/reproducing device as taught in Hirade et al (*Hirade et al, col. 2, lines 41-52*). It would have been obvious to modify the audio signal processing apparatus of Eberbach, Fujita et al and Willems with the recording/reproducing device of Hirade et al for the purpose of implementing the system with CD/portable players.

Contact

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2614

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on 9:00-5:00 EST Monday-Friday, Alt Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GEORGE MONIKANG/
Examiner, Art Unit 2614

8/4/11

/Devona E. Faulk/

Application/Control Number: 10/581,096

Page 9

Art Unit: 2614

Primary Examiner, Art Unit 2614